

***REMARKS/ARGUMENTS***

The following remarks are believed responsive to the points raised by the Office Action dated June 15, 2007.

***The Pending Claims***

As an initial point, it appears the Office Action Summary (PTOL-326), and numbered paragraph 10 in the Office Action, require clarification. The Office Action Summary states that claims 1-22 and 30-32 are pending, and numbered paragraph 10 in the Office Action rejects claims 24-28.

However, claims 1-22, 27, 28, and 30-32, are pending in the application.

***The Office Action***

It appears that numbered paragraph 10 in the Office Action requires additional clarification. While the paragraph refers to a rejection “on the ground of nonstatutory obviousness-type double patenting rejection,” it states a rejection “over Zuniga et al. or DeMeyer et al. in view of Katagiri et al. as applied above, in further view of Chen et al. (US 6,390,908).” Since the paragraph does not refer to the claims of a conflicting patent or application, and since the paragraph is set out subsequent to rejections under 35 USC 103 over Zuniga et al. in view of Katagiri et al., and DeMeyer et al. in view of Katagiri et al., it is believed that numbered paragraph 10 in the Office Action is intended to be a rejection under 35 USC 103, rather than a double patenting rejection.

If this understanding is incorrect, clarification in the next Office Action is respectfully requested.

***Double Patenting Rejections***

- a). Claims 1-22 were rejected on the ground of nonstatutory obvious-type double patenting as being unpatentable over claims 1-28 of U.S. Patent 6,913,669 to Ensinger (hereinafter referred to as “Ensinger ‘669”) in view of U.S. Patent 6,565,424 to Katagiri et al. (hereinafter referred to as “Katagiri et al.”).

b). Claims 30-32 were rejected on the ground of nonstatutory obvious-type double patenting as being unpatentable over claims 1-26 of Ensinger '669, in view of Katagiri et al. as applied to claims 1-22 above, and in further view of U.S. Patent 6,251,215 to Zuniga et al. (hereinafter referred to as "Zuniga et al.").

Each of these rejections is separately and respectfully traversed.

Ensinger '669 does not claim a retaining ring comprising a bearing ring made of a plastic material comprising a thermoplastic material, selected from the group consisting of PPS and PEEK, and abrasion-reducing and/or wear-reducing additives selected from the group consisting of PTFE, polyimide, and nanoparticles.

Neither Katagiri et al. nor Zuniga et al. teach or suggest the claimed retaining ring. For example, there is no teaching in either Katagiri et al. or Zuniga et al. of a bearing ring comprising abrasion-reducing and/or wear-reducing additives elected from the group consisting of PTFE, polyimide, and nanoparticles admixed with plastic material (*see*, Katagiri et al., col. 5, line 39, through col. 6, line 14, and Zuniga et al., col. 5, line 66, through col. 6, line 6).

The Office Action refers to Katagiri et al., col. 5, line 39, through col. 6, line 14 as the basis for a conclusion that this section provides motivation to construct the retaining ring of Ensinger '669 with the materials of Katagiri et al. for low wear, prevention of contamination and so that wafer edge deformation does not occur. However, Katagiri et al. fails to provide such motivation, and, in fact, teaches away from the claimed invention.

Katagiri et al. teaches "keeping a retainer ring and surface of a polishing wheel [in] non-contact with each other and controlling the gap therebetween within a certain range and by setting compression strength of the retainer ring at more than 3,000 kg/cm<sup>2</sup>" (col. 3, lines 11-15). This is emphasized throughout Katagiri et al.: "the retainer 3 does not contact with the polishing wheel 1. The processing of wafer with the retainer ring 3 being [in] non-contact with the polishing wheel 1 thus provides an advantage" (col. 3, lines 64-67). Additionally, glazing of the polishing wheel surface could not be prevented "without the technique of the present invention for keeping the retainer ring and polishing wheel [in] non-contact with each other" (col. 5, line 67 through col. 6, line 3). In other words, Katagiri et al. teaches *avoiding*

contact between the retaining ring and the polishing ring. This is in contradistinction to the present invention, which *requires* contact between the bearing ring (of the retaining ring) and the surface of the polishing ring.

Moreover, while Katagiri et al. refers to PPS and PEEK at col. 5, lines 43-44, Katagiri et al. emphasizes that these materials are *undesirable* for polishing, as they lead to the “technical problem regarding over-polishing in the wafer edge region” (col. 5, line 32). Katagiri et al. goes on to state that the use of these materials “plastically deform[s] the retainer ring 3” and increases the load at the wafer periphery resulting in over-polishing at the periphery (col. 5, lines 49-54). Katagiri et al.’s invention is directed to eliminating elasto-plastic deformation, or making it “negligible” (col. 6, lines 10-12). Thus, Katagiri et al. teaches away not only from using retaining rings with bearing surfaces, but it also teaches away from a retaining ring comprising a bearing ring made of a plastic material wherein the bearing ring rests “with a first front side on a polishing surface of a polishing apparatus.”

Furthermore, in addition to teaching away from using a plastic material to contact a polishing surface, Katagiri’s recommendation to use polyimide “*instead of PEEK*” (col. 6, lines 13-14, emphasis added) as a coating material “while keeping the retainer ring and polishing wheel [in] non-contact with each other” (col. 6, lines 2-3) further leads one away from a “plastic material of the bearing ring comprising a thermoplastic material, selected from the group consisting of PPS and PEEK, and abrasion-reducing and/or wear-reducing additives *admixed with* the plastic material, the abrasion-reducing and/or wear-reducing additives selected from the group consisting of PTFE, polyimide, and nanoparticles” (emphasis added).

Finally, in contrast with the present invention, that relates to a retaining ring with plastic as the main material forming the bearing ring, Katagiri et al. teaches a metal material with a very thin coating, such that wafer edge deformation does not occur, or elasto-plastic deformation is negligible (col. 6, lines 3-12).

The fact that Zuniga et al. may refer to a thickness of a metal ring is of no import. Zuniga et al. simply does not cure the deficiencies of Katagiri et al.

Accordingly, it is respectfully submitted that the double patenting rejections are improper, and should be withdrawn.

*Rejections under 35 USC 103*

- a). Claims 1, 2, 8, 9, 20, and 30-32 were rejected under 35 USC 103(a) as being unpatentable over Zuniga et al. in view of Katagiri et al.
- b). Claims 1-4, 6-9, 11-13, and 18-22 were rejected under 35 USC 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0070757 A1 to DeMeyer et al. (hereinafter referred to as "DeMeyer et al.") in view of Katagiri et al.
- c). Claims 10, 11, and 14-17 were rejected under 35 USC 103(a) as being unpatentable over Zuniga et al. in view of Katagiri et al. as applied to claims 1, 2, 8, 9, 20, and 30-32 above, further in view of U.S. Patent Application Publication 2002/0049030 to Numoto et al. (hereinafter referred to as "Numoto et al.").
- d). Claims 24-28 were apparently rejected under 35 USC 103(a) as being unpatentable over Zuniga et al. or DeMeyer et al. in view of Katagiri et al. as applied above, in further view of U.S. Patent 6,390,908 to Chen et al. (hereinafter referred to as "Chen et al."). NOTE: As set forth earlier in this response, while the Office Action rejected claims 24-28 on the grounds of nonstatutory obviousness-type double patenting, it is believed this was intended to be a rejection under 35 USC 103.

Each of these rejections is separately and respectfully traversed.

None of Zuniga et al., Katagiri et al., DeMeyer et al., Numoto et al., or Chen et al., teach or suggest a retaining ring comprising a bearing ring made of a plastic material comprising a thermoplastic material, selected from the group consisting of PPS and PEEK, and abrasion-reducing and/or wear-reducing additives admixed with the plastic material, the abrasion-reducing and/or wear-reducing additives selected from the group consisting of PTFE, polyimide, and nanoparticles.

For example, there is no teaching or suggestion in Zuniga et al. of a bearing ring comprising abrasion-reducing and/or wear-reducing additives elected from the group

consisting of PTFE, polyimide, and nanoparticles admixed with plastic material (*see*, Zuniga et al., col. 5, line 66, through col. 6, line 6).

Similarly, there is no teaching or suggestion in DeMeyer et al. of a bearing ring comprising abrasion-reducing and/or wear-reducing additives elected from the group consisting of PTFE, polyimide, and nanoparticles admixed with plastic material (*see*, DeMeyer et al., paragraphs [0004], [008], [0022], and [0030], as well as claims 9 and 12).

The Office Action refers to Katagiri et al., col. 5, line 39, through col. 6, line 14 as the basis for a conclusion that this section provides motivation to construct the retaining ring of Zuniga et al. or DeMeyer et al. with the materials of Katagiri et al. for low wear, prevention of contamination and so that wafer edge deformation does not occur. However, Katagiri et al. fails to provide such motivation, and, in fact, teaches away from the claimed invention.

Katagiri et al. teaches “keeping a retainer ring and surface of a polishing wheel [in] non-contact with each other and controlling the gap therebetween within a certain range and by setting compression strength of the retainer ring at more than 3,000 kg/cm<sup>2</sup>” (col. 3, lines 11-15). This is emphasized throughout Katagiri et al.: “the retainer 3 does not contact with the polishing wheel 1. The processing of wafer with the retainer ring 3 being [in] non-contact with the polishing wheel 1 thus provides an advantage” (col. 3, lines 64-67). Additionally, glazing of the polishing wheel surface could not be prevented “without the technique of the present invention for keeping the retainer ring and polishing wheel [in] non-contact with each other” (col. 5, line 67 through col. 6, line 3). In other words, Katagiri et al. teaches *avoiding* contact between the retaining ring and the polishing ring. This is in contradistinction to the present invention, which *requires* contact between the bearing ring (of the retaining ring) and the surface of the polishing ring.

Moreover, while Katagiri et al. refers to PPS and PEEK at col. 5, lines 43-44, Katagiri et al. emphasizes that these materials are *undesirable* for polishing, as they lead to the “technical problem regarding over-polishing in the wafer edge region” (col. 5, line 32). Katagiri et al. goes on to state that the use of these materials “plastically deform[s] the retainer ring 3” and increases the load at the wafer periphery resulting in over-polishing at the periphery (col. 5, lines 49-54). Katagiri et al.’s invention is directed to eliminating elasto-plastic deformation, or making it “negligible” (col. 6, lines 10-12). Thus, Katagiri et

al. teaches away not only from using retaining rings with bearing surfaces, but it also teaches away from a retaining ring comprising a bearing ring made of a plastic material wherein the bearing ring rests “with a first front side on a polishing surface of a polishing apparatus.”

Furthermore, in addition to teaching away from using a plastic material to contact a polishing surface, Katagiri’s recommendation to use polyimide “*instead of PEEK*” (col. 6, lines 13-14, emphasis added) as a coating material “while keeping the retainer ring and polishing wheel [in] non-contact with each other” (col. 6, lines 2-3) further leads one away from a “plastic material of the bearing ring comprising a thermoplastic material, selected from the group consisting of PPS and PEEK, and abrasion-reducing and/or wear-reducing additives *admixed with* the plastic material, the abrasion-reducing and/or wear-reducing additives selected from the group consisting of PTFE, polyimide, and nanoparticles” (emphasis added).

Finally, in contrast with the present invention, that relates to a retaining ring with plastic as the main material forming the bearing ring, Katagiri et al. teaches a metal material with a very thin coating, such that wafer edge deformation does not occur, or elasto-plastic deformation is negligible (col. 6, lines 3-12).

Accordingly, in view of the teaching away by Katagiri et al., and since Katagiri et al. does not cure the deficiencies of Zuniga et al. or DeMeyer et al., it is respectfully submitted that the rejections under 35 USC 103 are improper, and should be withdrawn.

Moreover, the Office Action states that the term “releasably attached” has been given the broadest interpretation of adjustable and/or separable. However, the Office Action provides no basis or explanation for these conclusions. In particular, the Office Action does not explain why interpreting “releasably attached” as “adjustable” is reasonable in the context of the present specification. With respect to the citation to *In re Dulberg*, 289 F.2d, 522, 523, 129 USPQ 348, 349 (CCPA 1961) and the MPEP 2144.04 V C, *Dulberg* merely held that “[w]hether a cap is made manually removable depends upon whether it is desired to gain ready access to the space covered by the cap” (289 F.2d, 523, 129 USPQ 349). While the Office Action concludes it would have been obvious to construct the bearing ring and carrier ring separable for ease of assembly/disassembly for maintenance, Katagiri et al. teaches that the entire retaining ring should be replaced (col. 3, line 67 through col. 4, line 2) and thus

there is no suggestion in Katagiri of disassembly for maintenance, and *Duhlberg* and MPEP 2144.04 V C are inapplicable.

The retaining ring of the present invention is patentably distinct from that of Zuniga et al., DeMeyer et al., and Katagiri et al. for the reasons set forth above. The facts that Numoto et al. may teach a snap ring and that Chen et al. may teach a ring including plastic is of no import. Numoto et al. simply does not cure the deficiencies of Zuniga et al., and Chen et al. simply does not cure the deficiencies of Zuniga et al. and DeMeyer et al., and therefore, the combinations also fail to render the present invention obvious.

Since the independent claim is allowable for the reasons set forth above, the dependent claims are allowable as they depend from the novel and non-obvious independent claim.

In summary, there is nothing in the cited references that would lead one of ordinary skill in the art to the claimed invention. For the reasons set forth above, reconsideration of the rejection is respectfully requested.

#### *Conclusion*

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



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